

The Use of Electrophoresis in a Taxonomic Study of the *Aedes varipalpus* Group and the *Ae. atropalpus* Group

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ABSTRACT. In the *Aedes varipalpus* group the larvae of *Ae. varipalpus* and *Ae. monticola* are reported to be morphologically very similar. In contrast a study of their protein bands showed very little similarity between them. A study of protein bands of the larvae of the four putative subspecies in the *Aedes atropalpus* group showed distinctive differences, therefore supporting the four subspecies rather than the two species concept of the group.

My role as a participant in this panel discussion of "A Multidisciplinary or Holistic Approach to Mosquito Systematics" is to show how electrophoresis can be used as a tool in mosquito systematics.

Electrophoresis has been found to be a useful tool in studying the systematics of various animal taxa (Avisé 1974). However, relatively little use has been made of this technique in mosquito systematics. The purpose of this paper is to review some preliminary work in which I used electrophoresis as a tool to study the species in two different groups of mosquitoes.

The *Aedes varipalpus* Group

Arnell and Nielsen (1972) conducted a thorough study of the five species in this group using primarily the methods of classical comparative morphology. They found that the fourth stage larvae of *Ae. varipalpus* (Coquillett) and *Ae. monticola* Belkin and McDonald were very similar and could not always be reliably separated, but *Ae. sierrensis* (Ludlow) was distinctly different from either of these two species.

I obtained fourth stage larvae of these three species and applied the technique of acrylamide gel electrophoresis to separate soluble proteins in the mosquito samples. The number of bands and the staining intensity of the bands were distinct for all three species. Of particular interest was the fact that *Ae. varipalpus* and *Ae. monticola* were much more distinguishable biochemically than they were morphologically (Lunt 1976).

The *Aedes atropalpus* group

O'Meara and Craig (1970) proposed that the group consisted of four subspecies based on differences in morphology, physiology and behavior. They found that all four subspecies were interfertile in laboratory crosses. Zavortink (1972) concluded that two distinct species were involved rather than four subspecies. He based his view on an extensive study of the geographical distribution and morphological features. Brust (1974) presented support of the two species concept based on mating studies in the laboratory and scanning electron micrographs of the chorionic sculpturing of the eggs.

I applied the acrylamide gel electrophoresis technique to samples of fourth stage larvae of the four putative subspecies in this group. Protein band characteristics were distinct for all four members and supported the four subspecies concept of the group (Lunt 1977).

LITERATURE CITED

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